

# ENVIRONMENTAL RESEARCH

TECHNOLOGY TRANSFER CONFERENCE • 1988

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Environment  
Ontario

Jim Bradley, Minister

## PROGRAM

November 28 & 29  
Royal York Hotel  
Toronto, Ontario  
Canada

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# WELCOME

## Message from the Minister of the Environment

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# ENVIRONMENTAL RESEARCH

## TECHNOLOGY TRANSFER CONFERENCE • 1988

Sponsored by  
Research and Technology Branch  
Environment Ontario

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1988

Jane Pagel – Conference Chair

### Conference Committees

#### Steering

Environment Ontario  
E. McIntyre  
D. McTavish  
M. Moselhy  
J. Pagel (Chair)  
E. Piché  
  
Environment Canada  
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M. Fielding (Chair)  
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L. Smith	Ontario Ministry of Health	H. Sims	Alberta Environment
J. Stopps	Ontario Ministry of Labour	G. Stokell	Ontario Ministry of Colleges and Universities
A. Underwood	Editor – Water and Pollution Control	M. Walmsley	Premier's Council Technology Fund Secretariat

# CONFERENCE INFORMATION

## Conference Location

The Royal York Hotel, 100 Front Street West, Toronto, Ontario M5J 1E3, Phone (416) 368-2511.  
Translation of the presentations will not be provided; all sessions will be conducted in English.  
Conference Publications together with receipts, meal tickets and name tags will be distributed on-site.

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## Presentations

Registration

Official Opening

Keynote Papers

Technical Sessions

Air Quality	Session A
Water Quality	Session B
Liquid & Solid Waste	Session C
Analytical Methods	Session D
Environmental Economics	Session E

Poster Displays

- ▶ Posters are available for viewing Monday and Tuesday.
- ▶ Authors will be available to answer questions on Tuesday from 1:30 pm to 2:30 pm.

Luncheons

Reception

Banquet

Followed by cash bar

## Location

Convention Floor Lobby

Concert Hall

Concert Hall

Territories Room

Tudor Rooms

Confederation Rooms

Alberta Room

Quebec Room

Ontario Room

Canadian Room

Ballroom

Canadian Room

Convention Floor Lobby

The views and ideas expressed in these presentations are those of the authors and do not necessarily reflect the views and policies of Environment Ontario nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

## REGISTRATION INFORMATION

The value-packed 2-day registration fee includes the following:

- ▶ attendance on both Monday and Tuesday
- ▶ 2 lunches
- ▶ Monday evening banquet with speaker
- ▶ a full set of conference publications contained in 6 volumes

Day 2 registration fee includes:

- ▶ attendance on Tuesday only
- ▶ lunch on Tuesday only
- ▶ a full set of conference publications contained in 6 volumes

Student registration fee includes:

- ▶ all of the features as outlined for the full 2-day registrant, with the **exception** of the Monday banquet.

### Registration Fees

Prior to November 14*	\$250
After November 14	\$300
Attendance Day 2 only	\$150
Student (does not include banquet)	\$ 50
Banquet only	\$ 30

\*Postmarked no later than November 12.

### Payment

To register for the Conference, please complete the registration form, enclose a cheque payable to the Technology Transfer Conference 1988 and mail to Congress Canada at the address below. Ministry staff should contact their directors for registration.

### Payment and Inquiries

Conference Secretariat  
c/o Congress Canada  
73 Richmond Street West, Suite 300  
Toronto, Ontario, Canada M5H 1Z4  
Telephone: (416) 860-1772  
Fax: (416) 860-0380

### Cancellations

Cancellations will be accepted postmarked up to and including November 14, 1988. Cancellations must be in writing; telephone cancellations will not be accepted. Refunds will be full fee, less a 25% administration charge. Following that date, substitution only will be accepted if received in **writing** by November 23, 1988. After November 23, changes will not be accepted.

## Confirmation of Registration

Confirmation of your conference registration will be sent to you providing your completed form has been received in the Congress Canada office by November 14, 1988. Confirmations of registrations received after that date will be distributed on-site.

## Hotel Accommodations

A block of bedrooms has been reserved at the Royal York Hotel at a rate of \$70.00 single and \$85.00 double. Please complete the Hotel Reservation Form on page 23, remove from this booklet and return direct to the Hotel. Any changes to your reservation should be made direct with the Hotel. Telephone reservations may be made with the Hotel by calling (416) 368-2511, specifying that you are attending the Technology Transfer Conference 1988.

## Hotel Address

Royal York Hotel  
100 Front Street West  
Toronto, Ontario, Canada M5J 1E3  
Attention: Reservations Manager  
Telephone: (416) 368-2511  
Fax: (416) 368-2884

## Conference Registration

Upon arrival at the Royal York Hotel, please register at the Conference Registration desk situated on the Convention Floor Lobby of the hotel (marked 'C' in the elevator). You will receive your name badge and all applicable meal tickets. Please wear your name badge at all times for admittance into Conference functions.

# MONDAY, NOVEMBER 28, 1988 PROGRAM SUMMARY

7:30 am	<b>Registration</b>	Convention Floor Lobby
9:00 am	<b>Official Opening</b> The Honourable Jim Bradley, Minister of the Environment <b>Introduced by</b> Gary Posen, Deputy Minister	Concert Hall
9:15 am	<b>Keynote Paper I:</b> Science-based Innovation and Prosperity Within "Sustainable Development" J. Fraser Mustard, The Canadian Institute for Advanced Research <b>Introduced by</b> Jane Pagel, Conference Chair	Concert Hall
10:00-10:20 am	<b>Coffee</b>	Convention Floor Lobby
10:20 am	<b>Technical Sessions A, B, C, D and E</b> <b>Poster Displays</b>	Check Program for Room Locations Ontario Room
12:20-1:40 pm	<b>Lunch</b>	Canadian Room
1:40 pm	<b>Technical Sessions A, B, C, D and E</b> <b>Poster Displays</b>	Check Program for Room Locations Ontario Room
3:20-3:45 pm	<b>Coffee</b>	Main Mezzanine
3:45 pm	<b>Technical Sessions A, B, C, D and E</b> <b>Poster Displays</b>	Check Program for Room Locations Ontario Room
5:30 pm	<b>Reception</b>	Ballroom
6:30 pm	<b>Banquet</b>	Canadian Room
8:30 pm	<b>Banquet Speaker:</b> Adrienne Clarkson, Adrienne Clarkson Books Inc., Executive Producer, Adrienne Clarkson Summer Festival, CBC <b>Introduced by</b> Gary Posen, Deputy Minister	
9:00 pm	<b>Excellence in Research Awards</b> Presented by The Honourable Jim Bradley, Minister of the Environment	

# MONDAY, NOVEMBER 28, 1988

9:00 am	<b>OFFICIAL OPENING:</b> The Honourable Jim Bradley, Minister of the Environment	
9:15 am	<b>KEYNOTE PAPER I:</b> Science-based Innovation and Prosperity Within "Sustainable Development" J. Fraser Mustard, The Canadian Institute for Advanced Research	
10:00 - 10:20 am	<b>C O F F E E</b>	
	<b>T E C H N I C A L   S E S S I O N S</b>	
Area of Research: Location: Chair:	<b>AIR QUALITY - SESSION A</b> <b>Territories Room</b> Ed Piché	<b>WATER QUALITY - SESSION B</b> <b>Tudor Rooms</b> David Balsillie
10:20 am Environment Ontario Research Program	<b>Air Quality Research: Current Status and Future Research Needs;</b> W. Chan, Air Resources Branch, Environment Ontario.	<b>Water Quality Research: Current Status and Future Research Needs;</b> C. Schenk, Water Resources Branch, Environment Ontario.
10:45 am Feature Papers	<b>A1   Science and Policy:</b> <b>Photochemical Oxidants and Acid Bearing Species;</b> K.L. Demerjian, Atmospheric Science Research Center, State University of New York, Albany, New York, U.S.A.	<b>B1   Aquatic Biology in the New Regulatory Framework;</b> K. Day, National Water Research Institute, Burlington, Ontario.
11:30 am	<b>A2   Relationship Between Forest Decline and Root Health of Ontario Sugar Maple;</b> C. Adams, M. Egyed and T. Hutchinson*, Dept. of Botany, University of Toronto, Toronto, Ontario.	<b>B2   Hypothesis Testing in Aquatic Toxicology: QSAR Relationships and Simple Kinetic Modelling;</b> L.S. McCarty*, University of Waterloo, Waterloo, Ontario, G.W. Ozburn and A.D. Smith, Lakehead University, Thunder Bay, Ontario.
11:55 am	<b>A3   A Numerical Decline Index Rating System to Monitor Changes in Tree Condition of Hardwood Forest Species;</b> D. McLaughlin*, W. McIlveen, W. Gizyn, D. Corrigan, R. Pearson and R. Arnup, Air Resources Branch, Environment Ontario.	<b>B3   Variations in the Response of Fish Population Characteristics to Environmental Changes;</b> K.R. Munkittrick* and D.G. Dixon, Department of Biology, University of Waterloo, Waterloo, Ontario.
12:20 - 1:40 pm	<b>L U N C H</b>	

<b>INTRODUCED BY:</b> Gary Posen, Deputy Minister			Concert Hall
<b>INTRODUCED BY:</b> Jane Pagel, Conference Chair			Concert Hall
Convention Floor Lobby			
<b>LIQUID &amp; SOLID WASTE - SESSION C</b> <b>Confederation Rooms</b> Don Chant		<b>ANALYTICAL METHODS - SESSION D</b> <b>Alberta Room</b> Gerry Ronan	
<b>ENVIRONMENTAL ECONOMICS -</b> <b>Quebec Room</b>		<b>SESSION E</b> André Castel	
<b>Liquid and Solid Waste Research: Current Status and Future Research Needs;</b> U. Sibul, Waste Management Branch, Environment Ontario.		<b>Analytical Method Development: Current Status and Future Research Needs;</b> R. Clement, Laboratory Services Branch, Environment Ontario.	
<b>Environmental Economics: Current Status and Future Research Needs;</b> A. Castel, Corporate Resources Division, Environment Ontario.			
<b>C1</b>	<b>An Overview of Hydrogeological Aspects of Waste Disposal: Research Results and Implications;</b> J. Cherry, Waterloo Centre for Groundwater Research, University of Waterloo, Waterloo, Ontario.	<b>D1</b>	<b>Analytical Chemistry in a Regulatory Environment;</b> R. Kagel, Dow Chemicals, Midland, Michigan, U.S.A.
<b>E1</b>	<b>Understanding Environmental-Economic Integration;</b> P.A. Victor, VHB Research Ltd., Toronto, Ontario.		
<b>C2</b>	<b>Immiscible Liquids and Vapours in Soil: Recent Experiments on Transport and Control;</b> G. Farquhar*, R. Bensen, D. Graham, E. McBean and B. Stickney, Dept. of Civil Eng., University of Waterloo, Waterloo, Ontario.	<b>D2</b>	<b>Adaptation of Water Preconcentration Techniques Developed for PCDD Analysis to Other Target Organic Pollutants;</b> E. Dowdall*, B.R. Hollebone, L. Brownlee and C. Shewchuk, Carleton University, Ottawa, Ontario.
<b>E2</b>	<b>Economic Valuation Disparities and Environmental Policies;</b> J.L. Knetsch, Economics Department, Simon Fraser University, Burnaby, British Columbia.		
<b>C3</b>	<b>Effects of Increasing Amounts of Non-polar Organic Liquids in Domestic Waste Leachate on the Hydraulic Conductivity of Clay Liners in Southern Ontario;</b> F. Fernandez* and R.M. Quigley, University of Western Ontario, London, Ontario.	<b>D3</b>	<b>The Purpose and Significance of Ultratrace Analysis of Dibenzo-p-Dioxins: The Concept of Risk;</b> L. Brownlee* and B.R. Hollebone, Chemistry Department, Carleton University, Ottawa, Ontario.
<b>E3</b>	<b>The Psycho-social Impacts of Exposure to Environmental Contaminants in Ontario: A Feasibility Study;</b> S.M. Taylor*, J. Frank, M. Haight, D. Streiner, S. Walter and N. White, McMaster University, Hamilton, Ontario.		
Canadian Room			

MONDAY, NOVEMBER 28, 1988

TECHNICAL SESSIONS		
Area of Research: Location: Chair:	AIR QUALITY - SESSION A Territories Room Percy Sims	WATER QUALITY - SESSION B Tudor Rooms Jim Bishop
1:40 pm	<p><del>A4</del> Investigation of Short-term Mutagenicity and Chemical Composition of Organic Solvent Extractable Fraction of Coke Oven Emission; A.J. Horton*, N. Belson, K. Shaw and G.H. Thomas, Ontario Research Foundation, Clarkson, Ontario.</p> <p><i>II-Vos</i></p>	<p>B4 An Examination of Chronic Toxicity of Thiocyanate to Freshwater Fish for the Development of a Water Quality Criterion; D.G. Dixon, R.P. Lanno* and S.D. Kevan, University of Waterloo, Waterloo, Ontario.</p>
2:05 pm	<p><del>A5</del> Quantitative Measurements of the Genetic Effects of Inhaled Carcinogens in Pulmonary Fibroblasts are Now Possible; J.A. Heddle*, A. Bouch and J.D. Gingerich, Dept. of Biology, York University, Downsview, Ontario.</p> <p><i>Spata-Govale</i></p> <p><i>Needle is do by test</i></p>	<p>B5 Potential Role of Polycyclic Aromatic Hydrocarbons in the Development of Liver Tumors in Fish from Polluted Sites of Lake Ontario; G.M. Kirby, I.R. Smith, C. Thorn, H.W. Ferguson and M.A. Hayes*, University of Guelph, Guelph, Ontario.</p> <p><i>2</i></p>
2:30 pm	<p>A6 Sensitivity of Asthmatic Children to Air Pollution; D. Pengelly* and C. Goldsmith, McMaster University, Hamilton, Ontario.</p>	<p>B6 Plant Bioassays for the Detection of Environmental Mutagens in an Aquatic Environment; W.F. Grant, Department of Biology, York University, Downsview, Ontario.</p>
2:55 pm	<p><del>A7</del> Hazardous Contaminants in Ontario: Environmental Fate and Human Exposure; D. Mackay*, and S. Paterson, Institute for Environmental Studies, University of Toronto, Toronto, Ontario.</p>	<p>B7 Effects of Temperature and Field Procedures on PCB Bioaccumulation in <i>Elliptio Complanata</i>; A. Melkic* and Y. Rollin, Integrated Explorations, Guelph, Ontario.</p>
3:20 - 3:45 pm	COFFEE	

LIQUID & SOLID WASTE - SESSION C Confederation Rooms Hardy Wong		ANALYTICAL METHODS - SESSION D Alberta Room Lesbia Smith		ENVIRONMENTAL ECONOMICS - Quebec Room Jim Merritt		SESSION E
C4	Technology Review: Biological Treatment of Hazardous Landfill Leachates; J. Fein*, and P. Yu, Diversified Research Laboratories Ltd., Toronto, Ontario.	D4	Procedures for the Analysis of 2, 3, 7, 8-Substituted PCDD & PCDF Isomers and Other Target Compounds in Environmental Samples; F.W. Karasek*, T.S. Thompson and K.P. Naikwadi, University of Waterloo, Waterloo, Ontario.	E4	Economic Assessments of MISA Regulations for Direct Industrial Dischargers in Ontario; O.E. Salamon* and J.A. Donnan, Policy and Planning Branch, Environment Ontario.	
C5	Phase Partitioning Kinetics at Industrial Waste Land Treatment Sites; D. Hockley and W.J. Snodgrass*, Beak Consultants, Toronto, Ontario.	D5	The Closed-Loop Stripping Technique, Applied to Potable Water to Solve Taste and Odour Problems; J.P. Palmentier*, D. Robinson and V. Taguchi, Laboratory Services Branch, Environment Ontario.	E5	The Extra Strength Sewer Surcharge to Regulate Industrial Sanitary Waste Discharges; M. Fortin*, Ecologistics, Waterloo, Ontario, G. Zukovs, CANVIRO, and J. Donnan and G. Zegarac, Environment Ontario.	
C6	Preliminary Assessment of a Microfiltration/Reverse Osmosis Process for the Treatment of Landfill Leachate; T.A. Krug* and S. McDougall, Zenon Environmental Inc., Burlington, Ontario.	D6	Solid Supported Processes in Environmental Analysis; J.M. Rosenfeld, Department of Pathology, McMaster University, Hamilton, Ontario.	E6	A Study of the Economic Factors Relating to the Implementation of Resource Recycling or Zero-Discharge Technologies for Heavy Metal Generating Industries in Canada; B. Fleet*, J. Kassirer, T. Burrell, T. Sanger, C. Small and B. Cardoza, University of Toronto, Toronto, Ontario.	
C7	Anaerobic Treatment of Landfill Leachate; G.P. Vicevic*, B.J. Forrestal and A. Stevenson, Ontario Research Foundation, Clarkson, Ontario.	D7	Synthesis and Use of Liquid Crystalline Polysiloxane Substrate in Capillary Column GC-MS for Isomer-Specific Separation of Toxic Isomers of PCDD and PCDF; K.P. Naikwadi* and F.W. Karasek, University of Waterloo, Waterloo, Ontario.	E7	Determinants of Participation in Solid Waste Source-Separation Programs in High-Rise Apartment Buildings; V.W. Maclaren, Department of Geography, University of Toronto, Toronto, Ontario.	

Main Mezzanine Floor

# MONDAY, NOVEMBER 28, 1988

TECHNICAL SESSIONS		
Area of Research: Location: Chair:	<b>AIR QUALITY - SESSION A</b> Territories Room Don Mills	<b>WATER QUALITY - SESSION B</b> Tudor Rooms Kim Shikaze
3:45 pm	A8 Verification of the Cloud and Wet Deposition Fields of a Mesoscale Model of Long-Range Transport of Air Pollutants; H.R. Cho*, S.T. Soong and J.V. Iribarne, Department of Physics, University of Toronto, Toronto, Ontario.	B8 Biomonitoring: Chemical Dependent Quantitative Relationships for the Body Burdens of Organic Chemicals in Aquatic Biomonitors; F. Gobas*, R. Russell and G. Haffner, Great Lakes Institute, University of Windsor, Windsor, Ontario.
4:10 pm	A9 Eulerian Model Evaluation; M. Alvo, Department of Mathematics, University of Ottawa, Ottawa, Ontario.	B9 Biomonitoring Protocols for Adult Aquatic Insects: Seasonal Availability, Sample Size and Sensitivity; Z.E. Kovats and J.J.H. Ciborowski*, Dept. of Biological Sciences, University of Windsor, Windsor, Ontario.
4:35 pm	A10 Scale Model Studies and Development of Prediction Procedures for Heavy Gas Dispersion in Complex Terrain 1988; P.A. Irwin*, M.C. Murphy and K.C. Heidorn, Rowan Williams Davies and Irwin Inc., Guelph, Ontario.	B10 An Ecosystem Approach to the Monitoring of PCB's in Pristine Ontario Lakes; C.D. Metcalfe* and C.R. Macdonald, Trent University, Peterborough, Ontario.
5:00 pm	A11 An Investigation of Wind Generated Particle Transport Rates within a Turbulent Boundary-Layer; A.D. Ciccone*, J.G. Kwall and J.F. Keffer, Department of Mechanical Engineering, University of Toronto, Toronto, Ontario.	B11 Metal Contamination of Wetland Foodchains in the Bay of Quinte, Ontario; A. Crowder*, W. Dushenko and J. Greig, Dept. of Biology, Queen's University, Kingston, Ontario.
5:30 pm	RECEPTION	
6:30 pm	BANQUET	

LIQUID & SOLID WASTE - SESSION C Confederation Rooms Boris Boyko		ANALYTICAL METHODS - SESSION D Alberta Room Doug McTavish		ENVIRONMENTAL ECONOMICS - Quebec Room Carl Griffith SESSION E	
C8	<b>The Origin and Distribution of Methane in the Alliston Sand Aquifer;</b> R. Aravena*, J. Barker, M. Bliss and L. Wassenaar, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario.	D8	<b>Development of Mobile Infrared Spectroscopy for On-site Speciation of Organic Wastes;</b> P. Yang* and J. Osborne, Laboratory Services Branch, Environment Ontario.	E8	<b>The Ontario Environmental Protection Industry and the Impact of Environmental Expenditures on the Ontario Economy;</b> L.M. Coplan, Policy and Planning Branch, Environment Ontario.
C9	<b>The Carbon and Sulfur Cycle in Shallow Unconfined Aquifer Systems;</b> L.I. Wassenaar*, R. Aravena, R.W. Gillham, J. Barker and P. Fritz, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario.	D9	<b>Mobile Laboratory: On the Development and Real World Application Aspects;</b> D. Toner*, B. Dalton, D. Morse, K. Hom, P. Yang and J. Osborne, Laboratory Services Branch, Environment Ontario.	E9	<b>Critique and Discussion</b> E. Cowan, Hickling Associates Ltd.  Examples of environmental-economic integration found in the papers which were presented in this session will be highlighted. Some examples will be drawn from the Speaker's own work concerning the economic impacts of environmental regulation. Changing attitudes and concerns on the part of business and industry with respect to environmental regulation will be discussed as well.
C10	<b>Determination of Organic and Inorganic Contaminants in the Welland River;</b> I.D. Brindle*, A.W. Chu and X-f. Li, Chemistry Department, Brock University, St. Catharines, Ontario.	D10	<b>Regiospecific Synthesis of All Isomeric Nitrofluorenones and Nitrofluorenes by Transition Metal Catalyzed Cross Coupling Reactions;</b> V. Snieckus*, T. Iihama, J.-m. Fu and M. Bourguignon, University of Waterloo, Waterloo, Ontario.		
C11	<b>Research and Development of Permanent On-site Solutions for Contamination of Groundwater at Waste Disposal and Industrial Sites in Canada;</b> R.J. Rush, CANVIRO Consultants, Kitchener, Ontario.	D11	<b>Preparation of Heterocyclic Polynuclear Aromatic Compounds as Analytical Standards;</b> E. Lec-Ruff*, B.E. George, F.J. Ablenas and Y.S. Chung, Department of Chemistry, York University, Downsview, Ontario.		
Ballroom					
Canadian Room					

# MINISTRY OF THE ENVIRONMENT EXCELLENCE IN RESEARCH AWARDS

## Principle Investigators Awards

These awards are presented to selected principle investigators of research projects funded through the Research Advisory Committee in recognition of their contributions to environmental research in the following areas:

1. Air Pollution
2. Water Pollution
3. Liquid and Solid Waste and Spill
4. Analytical Methods and Pollution Monitoring Instrumentation
5. Environmental Socio-economics
6. Pesticides Advisory Committee Research

In presenting these awards, the Ministry recognizes both the principle researchers and their institutions. Each award recipient receives a citation and a sum of \$1,000., while their institution is presented with a plaque in recognition of the support and encouragement given throughout the project.

Environment Ontario liaison officers working on these projects receive awards of merit for their technical liaison on behalf of the Ministry.

## Student Awards

This year, for the first time, Awards of Excellence will be presented to selected students and graduates of Ontario Universities. The awards are instituted by Environment Ontario to encourage students to undertake research in the field of environmental science and technology. Each successful student receives a citation and a sum of \$1,000.

The Honourable Jim Bradley, Minister of the Environment, will announce the successful candidates for this year and will distribute the awards at the Conference banquet on November 28, 1988.

## Winners of the 1987 Investigators Awards

- ▶ John Cherry, University of Waterloo
- ▶ Francis Karasek, University of Waterloo
- ▶ Harold Schiff, York University
- ▶ Pat Seyfried, University of Toronto

## TUESDAY, NOVEMBER 29, 1988 PROGRAM SUMMARY

7:30 am	<b>Registration</b>	Convention Floor Lobby
9:00 am	<b>Keynote Paper II:</b> Deriving Benefits from Environmental Research Stuart Smith, Rockcliff Research and Technology Inc. <b>Introduced by</b> Julyan Reid, Assistant Deputy Minister	Concert Hall
9:45-10:15 am	<b>Coffee</b>	Convention Floor Lobby
10:15 am	<b>Technical Sessions A, B, C and D</b> <b>Poster Displays</b>	Check Program for Room Locations Ontario Room
12:15-1:30 pm	<b>Lunch</b>	Canadian Room
1:30-2:30 pm	<b>Meet the Researchers:</b> <b>A Dedicated Poster Session</b>	Ontario Room
2:30-4:35 pm	<b>Technical Sessions A, B, C and D</b>	Check Program for Room Locations
3:20-4:35 pm	<b>Panel Discussion</b> Topic: Stemming the Rising Tide of Waste Moderator: Don Mackay, University of Toronto	Confederation Rooms

# TUESDAY, NOVEMBER 29, 1988

9:00 am	KEYNOTE PAPER II: Deriving Benefits from Environmental Research Stuart Smith, Rockcliff Research and Technology Inc.	
9:45 - 10:15 am	C O F F E E	
	T E C H N I C A L   S E S S I O N S	
Area of Research: Location: Chair:	AIR QUALITY - SESSION A Territories Room Walter Giles	WATER QUALITY - SESSION B Tudor Rooms Henri St.Martin
10:15 am Feature Papers	A12 Incineration of Wastes; K. Davies, Environmental Protection Office, City of Toronto, Toronto, Ontario.	B12 An Overview of Aquatic Environmental Research in Quebec; M. Slivitsky, INRS-EAU, Ste. Foy, Quebec.
11:00 am	A13 Detectability of Step Trends in the Rate of Atmospheric Sulphate Deposition; E.A. McBean*, M.G. Kompter and G.J. Farquhar, Department of Civil Engineering, University of Waterloo, Waterloo, Ontario.	B13 Development of an Improved System for the Application of Powdered Activated Carbon in Water Treatment Plants; H. Donison*, A. Benedek and J.J. Bancsi, Zenon Environmental Inc., Burlington, Ontario.
11:25 am	A14 Incinerator and Steel Plant Contributions to Air Particulates as Determined by Size-Specific Receptor Modelling; A.C. Chan*, Z.J. Kang and R.E. Jervis, Dept. of Chemical Engineering, University of Toronto, Toronto, Ontario.	B14 Municipal Utilization of Water Demand Management Strategies in Ontario Municipalities; R.D. Kreutzweiser* and R.B. Feagan, Dept. of Geography, University of Guelph, Guelph, Ontario.
11:50 am	A15 A Study on the Sources of Acid Precipitation in Ontario, Canada; P.K. Hopke* and Y. Zeng, Department of Civil Engineering, University of Illinois, Urbana, Illinois, U.S.A.	B15 A Preliminary Study to Determine the Feasibility of Medium Pressure Mercury Lamps for Disinfecting Low Quality Wastewaters; G.E. Whitby and G. Sakamoto, Trojan Technologies Inc., London, Ontario, and G. Palmateer*, Environment Ontario.
12:15 - 1:30 pm	L U N C H	
1:30 - 2:30 pm	MEET THE RESEARCHERS: A DEDICATED POSTER SESSION	

INTRODUCED BY:  
Julyan Reid, Assistant Deputy Minister

Concert Hall

Convention Floor

LIQUID & SOLID WASTE - SESSION C		ANALYTICAL METHODS - SESSION D		NOTES
Confederation Rooms		Alberta Room		
Erv McIntyre		Calvin Cupp		
C12	<b>The Role of Groundwater in Human Society;</b> R.N. Farvolden, Waterloo Centre for Groundwater Research, University of Waterloo, Waterloo, Ontario.	D12	<b>Application of ICP Spectrometry in Health and Environment: A Case Study of Soil Ingested by Children;</b> R. Barnes, University of Massachusetts, Amherst, Massachusetts, U.S.A.	
C13	<b>Dispersion of the Stouffville Landfill Plume;</b> I. Proulx* and R.N. Farvolden, Waterloo Centre for Groundwater Research, University of Waterloo, Waterloo, Ontario.	D13	<b>Direct Sample Insertion into an Inductively Coupled Plasma for Atomic Emission and Mass Spectrometry;</b> L. Blain* and E.D. Salin, Department of Chemistry, McGill University, Montreal, Quebec.	
C14	<b>Comparison of an Experimental Municipal Refuse Column Study with Landfill Field Test Cells;</b> S. Pirani and D.W. Kirk*, Dept. of Chemical Engineering, University of Toronto, Toronto, Ontario.	D14	<b>Analysis of Germanium and Tin by Hydride Generation D.C. Plasma Atomic Emission Spectrometry: Application to Determinations of Germanium and Tin in Air Filters;</b> I.D. Brindle*, B. Buchanan and X-c. Le, Brock University, St. Catharines, Ontario.	
C15	<b>An Alternative to Incineration of Biomedical Waste: Hammermill/Chemical Decontamination;</b> J. Manuel, Waste Management Branch, Environment Ontario.	D15	<b>Use of the Hot Slurry Technique for Solid Sample Introduction for ICP-AES;</b> L. Gervais* and E.D. Salin, Department of Chemistry, McGill University, Montreal, Quebec.	

Canadian Room

Ontario Room

	TECHNICAL SESSIONS	
Area of Research: Location: Chair:	<b>AIR QUALITY - SESSION A</b> Territories Room Don Huff	<b>WATER QUALITY - SESSION B</b> Tudor Rooms Ivy Wile
2:30 pm	<b>A16</b> <b>Advanced Techniques for Mobile Monitoring of Trace Organics in Air;</b> G.B. De Brou*, E. Singer, M.A. Sage, R.W. Bell, R.E. Chapman and D.J. Ogner, Air Resources Branch, Environment Ontario.	<b>B16</b> <b>Characterization of the Fecal Indicator Bacterial Flora of Sanitary Sewage with Application to Identifying the Presence of Sanitary Waste in Storm Sewers;</b> P.L. Seyfried*, T. Bleier, Y. Xu and R. Harmandayan, University of Toronto, Toronto, Ontario.
2:55 pm	<b>A17</b> <b>Atmospheric Trace Gas Measurements Using a Tunable Diode Laser Absorption Spectrometer;</b> D.R. Hastie* and H.I. Schiff, Department of Chemistry, York University, Downsview, Ontario.	<b>B17</b> <b>Landsat-5 TM Spectral Responses for Lakes Across Northeastern Ontario;</b> J.R. Pitblado, Geography Department, Laurentian University, Sudbury, Ontario.
3:20 pm	<b>A18</b> <b>Biomedical Waste Incineration Testing Program;</b> V. Ozvacic*, G. Wong, G. Marson, R. Clement, D. Rokosh, S. Suter, G. Horsnell, J.C. Hipfner, S. Burns and H. Corinthios, Environment Ontario.	<b>B18</b> <b>Relationship of Mercury Levels in Sportfish with Lake Sediment and Water Quality Variables;</b> C.D. Wren, B.A.R. Environmental, Guelph, Ontario.
3:45 pm	<b>A19</b> <b>A Study of High Temperature Photochemical Kinetics of Sulphur Dioxide and Nitrogen Oxides for a Flue Gas Treatment Process;</b> J. Hunt*, P. Fellin, K.A. Brice, D. Ernst, D. Glendenning and R. Caton, Concord Scientific, Toronto, and C. Fung and K. Smith, Environment Ontario.	<b>B19</b> <b>Trend Analysis Procedures for Water Quality Time Series;</b> A.I. McLeod* and K.W. Hipel, McLeod-Hipel Associates Ltd., London, Ontario, and B. Bodo, Environment Ontario.
4:10 pm	<b>A20</b> <b>Modelling the Photochemical Decomposition of Chlorinated Phenols by Sunlight;</b> N.J. Bunce* and J.S. Nakai, Dept. of Chemistry and Biochemistry, University of Guelph, Guelph, Ontario.	<b>B20</b> <b>Use of a Bromobenzoate for Cross-Adaptation of Anaerobic Bacteria in Lake Ontario Sediments for Biodegradation of Chlorinated Aromatics;</b> M. Urbanek*, T. Strycek, R.C. Wyndham and M. Goldner, University of Toronto, Toronto, Ontario.

LIQUID & SOLID WASTE - SESSION C		ANALYTICAL METHODS - SESSION D		NOTES
Confederation Rooms Don Mackay		Alberta Rooms Jim Stopps		
C16	Erosion of Landfill Covers; J. Cuthill*, Department of Land Resource Science, University of Guelph, Guelph, Ontario, and K. McKague, Ecologistics Ltd., Waterloo, Ontario.	D16	Advanced Technology for Destruction of Waterborne Organic Pollutants; H. Al-Ekabi* and M. Robertson, Nulite, A Division of Nutech Energy System Inc., London, Ontario.	
C17	Development of Backfill and Construction Application Guidelines for Ontario; M. Kelleher* and B. Whiffin, CANVIRO Consultants, Mississauga, Ontario.	D17	Development of ACexpert 2: Implementation of an Expert System for Automated Metal Analysis by Atomic Absorption Spectroscopy; M.J. Stillman*, T.A. Cox and W.R. Browett, University of Western Ontario, London, Ontario.	
C18	Panel Discussion: Stemming the Rising Tide of Waste  Moderator: Don Mackay, University of Toronto  Members: <ul style="list-style-type: none"><li>Colin Isaacs, Pollution Probe</li><li>Romeo Palombella, Government Refuse Collection and Disposal Association</li><li>Hardy Wong, Environment Ontario</li></ul>	D18	Adaptation of Water Preconcentration Techniques of Trace Metal Detection; K.L. Singfield*, B.R. Hollebone, L.J. Brownlee, Dept. of Chemistry, Carleton University, Ottawa, Ontario, and P. Vijan, Environment Ontario.	
		D19	Comparison of Various Leachate Extraction Procedures for the Characterization of Inorganics in Wastes; J.R. Kramer*, P. Brassard, J. Gleed and P.V. Collins, Department of Geology, McMaster University, Hamilton, Ontario.	
		D20	2,4-Dichlorophenoxyacetic Acid (2,4-D) Determination in Water, Urine and Soil Extracts by Enzyme Immunoassay (EIA) and Radioimmunoassay (RIA); J.C. Hall* and K. Krieg, Dept. of Environmental Biology, University of Guelph, Guelph, Ontario.	

## POSTER PRESENTATIONS

### Air Quality Research

- AP1. **Stochastic Modelling of Dispersion from Single Elevated Sources;** E. Robertson and P.J. Barry, Atomic Energy of Canada Limited, Chalk River Nuclear Laboratories, Chalk River, Ontario.
- AP2. **Feasibility Study for Assessing and Modelling Microclimatic Conditions on the Fonthill Kame (Phase 1);** T.B. Shaw, Brock University, St. Catharines, Ontario.
- AP3. **Critical Evaluation of Atmospheric Pollutant Parameterization from Satellite Imagery;** N.T. O'Neill, A. Royer and L. Hubert, Université de Sherbrooke, Sherbrooke, Quebec, and J. Miller and J. Freemantle, CRESS, York University, Downsview, Ontario, and G. Austin and A. Davis, McGill University, Montreal, Quebec.
- AP4. **A 3-D Mesoscale Wind Field Model and its Application for Emergency Planning at Nuclear Power Plants in Ontario;** H. Sahota, P.K. Misra, R. Bloxam and D. Rhee, Air Resources Branch, Environment Ontario.
- AP5. **The Results from a Meso-scale Model;** M. Niewiadomski, University of Toronto, Toronto, Ontario.
- AP6. **Dose Response for Selected Environmental Air Pollutants: Results from a Study on Runners;** R.B. Urch, F. Silverman, P. Corey and R.J. Shephard, The Gage Research Institute, University of Toronto, Toronto, Ontario.
- AP7. **Hamilton Air: Chemical Composition and Genotoxic Activity of Respirable Particulate and Organic Vapours;** D.W. Bryant, C. Kaiser-Farrell and D.R. McCalla, Department of Biochemistry, McMaster University, Hamilton, Ontario.
- AP8. **Mutagenicity Studies and Risk Estimation of Complex Mixtures of Organic Airborne Contaminants;** A.S. Raj and D.M. Logan, Department of Biology, York University, Downsview, Ontario. *fixtures & then additive.*
- AP9. **In-Situ Monitoring of the Environment for Genotoxicity Levels Using Rodents;** M. Petras, M. Vrzoc, S. Meddins, K. Hill and T. Sands, Department of Biological Sciences, University of Windsor, Windsor, Ontario. *SCE ↑ diesel repair garage*
- AP10. **Method Development for the Monitoring and Analysis of Odorous Organics in Ambient Air;** C.C. Chan, L. Vainer and J.W. Martin, Mann Testing Laboratories Ltd., Mississauga, Ontario, and A. Szakolcai and B. Foster, Environment Ontario.
- AP11. **Gas Phase Analysis of Organic Compounds from Structural Domain Modulation within Fluorescent Lipid Multilayers;** U.J. Krull, R.S. Brown and K. Stewart, Department of Chemistry, Erindale Campus, University of Toronto, Mississauga, Ontario.
- AP12. **Atmospheric Measurements of Natural Hydrocarbons Using Gas Chromatography/Mass Spectrometry;** H. Niki and B.H. Khouw, Department of Chemistry and Centre for Atmospheric Chemistry, York University, Downsview, Ontario.

## POSTER PRESENTATIONS

- AP13. **Utilization of Established Air Pollution Monitoring Networks in Ontario Following Nuclear Incidents;** J.A. Slade and G. Laszlo, Radiation and Industrial Safety Branch, Atomic Energy of Canada Limited, Chalk River, Ontario.
- AP14. **A Re-examination of Ontario's 24 Hour Ambient Air Quality Criterion for Hydrogen Fluoride;** R.D. Jones and D.S. Harper, Air Resources Branch, Environment Ontario.
- AP15. **Production of Ozone-insensitive White Bean Varieties;** T.E. Michaels, Department of Crop Science, University of Guelph, Guelph, Ontario.
- AP16. **Efficacy of Film-forming Chemicals for Protecting Roadside Trees Against Salt Spray;** C. Chong, Ministry of Agriculture and Food, Horticultural Research Institute of Ontario, Vineland Station, Ontario.
- AP17. **An Evaluation of the Problems of Particulate Emission from the Wood Products Industry;** M.F. Lepage and A.E. Davies, Rowan Williams Davies & Irwin Inc., Guelph, Ontario.
- AP18. **Relationship of Sugar Maple Decline and Corresponding Chemical Changes in Xylem Sap Carbohydrates, Micronutrients and Trace Elements;** S.N. Pathak, T. Hutchinson and D.N. Roy, Department of Forestry, University of Toronto, Toronto, Ontario.
- AP19. **Identification of Long Range Aerosol Sources at the Dorset Environment Station;** J. Drake, A. Kabir and S. Vermette, Department of Geography, McMaster University, Hamilton, Ontario.
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## Water Quality Research

- BP1. **The Effects of Agricultural Drainage on Sediment and Water Quality Loadings;** W.E. Watt, Department of Civil Engineering, Queen's University, Kingston, Ontario.
- BP2. **WATQUAS 2.0: An Expert System for the Water Quality Assessment of Ontario Rivers;** W.C. Allison and T.E. Unny, Department of Civil Engineering, University of Waterloo, Waterloo, Ontario, and L. Logan, Environment Ontario.
- BP3. **Geochemical Characterization, Size Fractionation and Bioavailability of Trace Metal Particulate Associations in the Don River;** L. Warren and A.P. Zimmerman, Department of Zoology, University of Toronto, Toronto, Ontario.
- BP4. **The Investigation, Evaluation and Recommendations of Biomonitoring Organisms for Procedures Development for Environmental Monitoring;** C.A. Jefferson, Curry-Jefferson Environmental Services, Port Perry, Ontario.
- BP5. **The Ontario Inland Lakes Program and Management of Blue-Green Algae: Three Whole Lake Treatments in 1988;** H. Vandermeulen and K.H. Nicholls, Water Resources Branch, Environment Ontario.
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## POSTER PRESENTATIONS

- BP6. **Characterization of the Grazing Fauna Within Five Softwater Lakes With Respect to Accumulations of Metaphytic Filamentous Algae;** P.M. Stokes, E.T. Howell and R.L. France, Institute for Environmental Studies, University of Toronto, Toronto, Ontario.
- BP7. **Sedimentary Chrysophycean Cyst Assemblages as Paleoindicators in Acid Sensitive Lakes;** M. Rybak and I. Rybak, ARECO Canada Inc., Ottawa, Ontario, and K. Nicholls, Environment Ontario.
- BP8. **Factors Regulating Contaminant Levels in Forage Fish Species;** C.E. Hebert and G.D. Haffner, Great Lakes Institute, University of Windsor, Windsor, Ontario.
- BP9. **The Isotopic Composition of Upland Forest Soil Sulphate;** D.R. Van Stempvoort and P. Fritz, Department of Earth Science, University of Waterloo, Waterloo, Ontario.
- BP10. **Recent Trends and Historical Changes in Water Quality of Lake Muskoka;** M. Rybak and I. Rybak, ARECO Canada Inc., Ottawa, Ontario, and K. Nicholls, Environment Ontario.
- BP11. **In-Situ Determination of Fecal Indicator Bacterial Survival in Agriculturally-Impacted Watersheds;** M.J. Walters, Lake Simcoe Region Conservation Authority, Newmarket, Ontario.
- BP12. **Development of an Acute and Chronic Sediment Bioassay Protocol Using Larval Mayflies and Juvenile Fathead Minnows;** G. Krantzberg and R. Pope, University of Toronto, Toronto, Ontario.
- BP13. **Three Hour Pulse Exposure of Potassium Thiocyanate to Rainbow Trout Eggs Before and After Water Hardening;** S. Kevan and G. Dixon, University of Waterloo, Waterloo, Ontario.
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## Liquid and Solid Waste Research

- CP1. **Retractable Composite Adsorbents for Environment Clean-up;** B. Gillies, E. Stublely, I. Treurnicht and L. Read, EcoPlastics Ltd., Willowdale, Ontario, and O. Meresz, Laboratory Services Branch, Environment Ontario.
- CP2. **Treatment and Disposal of Hauled Sewage Under Part VII, Environmental Protection Act;** J.L. Smith, Oliver, Mangione, McCalla & Associates Limited, Nepean, Ontario.
- CP3. **Factors Affecting the Concentration of Metal Ions in Municipal Refuse Leachate;** G. Kosta, S. Pirani and D. Kirk, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, Ontario.
- CP4. **Slow Rate Infiltration Land Treatment and Recirculation of Landfill Leachate in Ontario;** R.A. McBride, A.M. Gordon, P.H. Groenevelt, T.J. Gillespie and L.J. Evans, Departments of Land Resource Science and Environmental Biology, University of Guelph, Guelph, Ontario.
- CP5. **Establishing Vegetation on Erosion-prone Landfill Slopes in Ontario, Year Two;** T.W. Hilditch and C.P. Hughes, Gartner-Lee Ltd., Markham, Ontario.
- CP6. **Evaluating Groundwater Velocity in a Low-Permeability Fractured Shale;** K.S. Novakowski and J.A. Cherry, Centre for Groundwater Research, University of Waterloo, Waterloo, Ontario.

## POSTER PRESENTATIONS

- CP7. **The Design and Evaluation of In-Situ Bioremediation Methods for the Treatment of Sludges and Soils at Waste Disposal Sites;** K.L. Berry-Spark and J.F. Barker, Centre for Groundwater Research, University of Waterloo, Waterloo, Ontario.
- CP8. **Enhanced Biodegradation of Aromatic and Chlorinated Aliphatic Compounds in a Leachate-Impacted Aquifer;** D.W. Acton, M. Shaw, J.F. Barker, C.I. Mayfield and J.A. Cherry, University of Waterloo, Waterloo, Ontario.
- CP9. **Waste Management Planning for Pharmaceutical Industry;** R. Stairs and R. Makhija, Trent University, Peterborough, Ontario.
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### Analytical Methods Research

- DP1. **Derivatization of Acidic Organic Compounds Using Phase Transfer Catalysis;** V.Y. Taguchi and O.W. Berg, Laboratory Services Branch, Environment Ontario.
- DP2. **New Chemical Ionization Reagents Directed Toward Mass Spectrometric Analysis of Trace Organics;** T.B. McMahon, K. Froese and C.E. Allison, Department of Chemistry and Guelph-Waterloo Centre for Graduate Work in Chemistry, University of Waterloo, Waterloo, Ontario.
- DP3. **An Interrupted Segmented Flow Stream Microwave Solid Sample Decomposition for ICP-AES;** E.D. Salin and B. Liu, Department of Chemistry, McGill University, Montreal, Quebec.
- DP4. **Solid Phase Extraction of PAH's from Drinking Water and Analysis of Chlorophenols and Phenoxy-acid Herbicides in Water;** W.G. Craig and C.D. Hall, Paracel Laboratories Ltd., Nepean, Ontario.
- DP5. **Automated Water Preconcentration Sampler for Dioxin Detection at the Parts Per Quadrillion Level;** C. Shewchuk, B. Hollebone, L. Brownlee and E. Dowdall, Carleton University, Ottawa, Ontario, and R. Hunsinger, M. Uza, H. Tosine and S. Suter, Environment Ontario.
- DP6. **Automated HPLC Method for Low Level Polynuclear Aromatic Hydrocarbon (PAH) Analysis of Drinking Water;** P.W. Crozier and C.D. Hall, Laboratory Services Branch, Environment Ontario.
- DP7. **Supercritical Fluid Extraction of Trace Organics from Solid Matrices;** P. Kruus and R.C. Burk, Department of Chemistry, Carleton University, Ottawa, Ontario, and G. Crawford, Laboratory Services Branch, Environment Ontario.
- DP8. **Automated Sample Introduction and Pre-treatment with Flow Injection ICP-ES;** J.F. Hopper, F. Mo and D.W. Boomer, Laboratory Services Branch, Environment Ontario.
- DP9. **Applications of Flow Injection Technology to ICP-MS;** M.J. Powell, J.F. Hopper and D.W. Boomer, Laboratory Services Branch, Environment Ontario.
- DP10. **Investigation of the In-Situ Acetylation Process and its Applicability to the Analysis of a Wide Range of Phenolic Compounds in Water;** R. Lega, O. Meresz and M. Savu, Laboratory Services Branch, Environment Ontario.
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## POSTER PRESENTATIONS

- DP11. **Robustness of the Student's T-test with Censored Environmental Quality Data;** E.E. Creese, Creese Environmental Consulting, Waterloo, Ontario.
- DP12. **Automation of Solid Supported Reactions by Robotics;** J.M. Rosenfeld and E. Pevolinas, McMaster University, Hamilton, Ontario.
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### Environmental Economics

- EP1. **The New Economics of Sustainable Development;** R.Z. Rivers, Water Planning and Management Branch, Canada Centre For Inland Waters, Environment Canada, Burlington, Ontario.
- EP2. **The Environmental Effects of Forestry Operations in Ontario: How Much Do We Know?;** J.A. Dunster, Federation of Ontario Naturalists, Toronto, Ontario.

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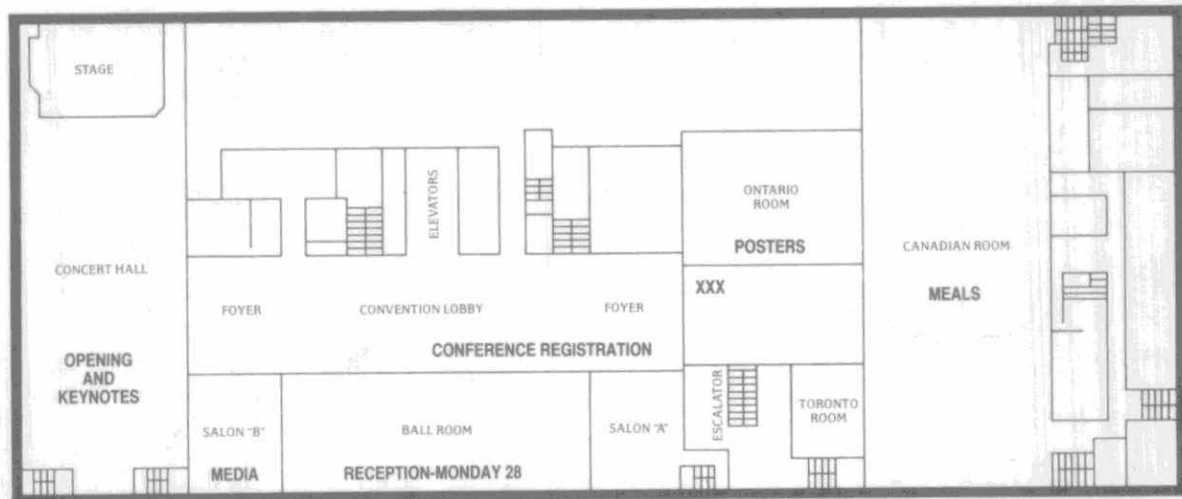
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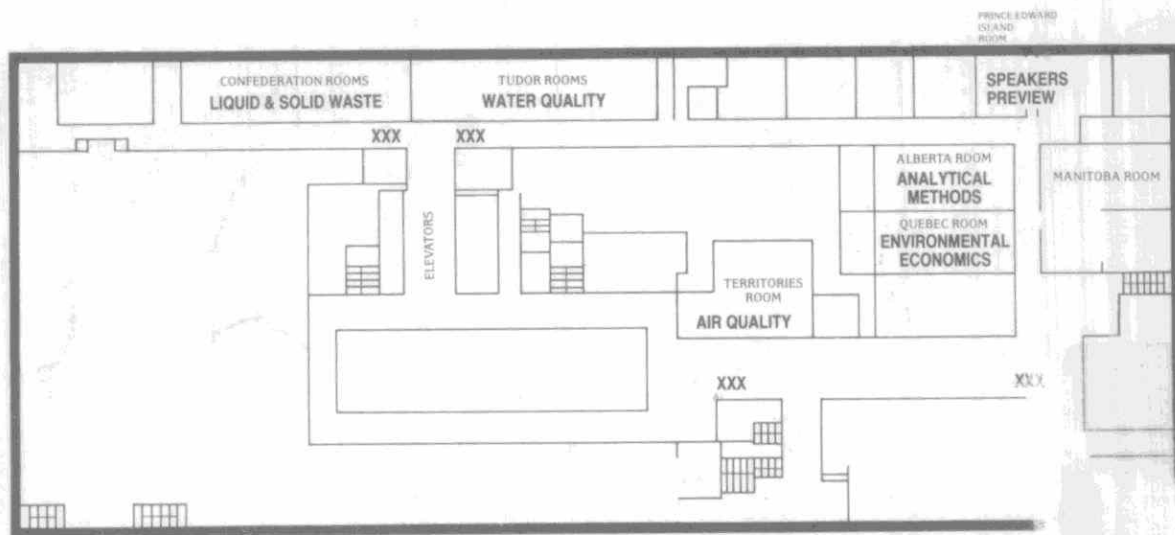
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